Basic Carbohydrate Counting

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History of CHO Counting

- Used effectively during the Diabetes Control and Complications Trial (DCCT 1993)
- Meal planning method of choice for years in the United Kingdom.

From Practical Carbohydrate Counting 2nd edition. American Diabetes Assoc

Objectives

- (1) Describe how to assess a patient's needs for carbohydrate.
- (2) Describe how to develop an optimal pattern of carbohydrate intake based on a patient's needs, lifestyle and schedule
- (3) Identify possible patterns of carbohydrate intake that inhibit euglycemia and methods of teaching patients how to do this themselves.

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Benefits of MNT (Medical Nutrition Therapy)

Decreases in AIC

- 1% decrease in Type 1 DM
- 1-2% decrease in Type 2 DM

(Pastors et al. 2002; Pastors, Franz, et al. 2003)

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MNT Goals for Diabetes Management

1. Achieve and maintain:

   a. Blood glucose levels in the normal range or as close to normal as possible

   b. A lipid and lipoprotein profile that reduces the risk o vascular disease.

   c. Blood pressure levels in the normal range or as close to normal as possible

MNT Goals for Diabetes Management (cont.)

- 2. Prevent, or at least slow the rate of development of chronic complications of diabetes by modifying nutrient intake and lifestyle

- 3. Address individual nutrition needs, taking into account personal and cultural preferences and willingness to change.

- 4. Maintaining the pleasure of eating by limiting food choices only when indicated by scientific evidence.

MNT Goals for Diabetes Management (cont.)

- 4. Maintaining the pleasure of eating by limiting food choices only when indicated by scientific evidence.

MNT Goals: What's Normal??

- AIC: **<7.0%**
- Preprandial: **BG 70-130 mg/dl**
- Peak postprandial BG: **<180 mg/dl**

(1-2 hrs after the beginning of the meal)

- Stricter glycemic goals (AIC <6%) may further reduce risk of complications at the risk of hypoglycemia
- If AIC goal not met, despite preprandial goals within range, consider careful examination of postprandial glucose.

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MNT Goals: What's Normal?? (Special Populations)

GDM SMBG goals

Preprandial: <95 mg/dl

2 hr postprandial: < 120 mg/dl

Peds AIC goals

Children < 6 years old: 7.5-8.5%

Children 6-12 years old: < 8%

Adolescents: 7.5%

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Who can Benefit from CHO Counting?

Patients with:

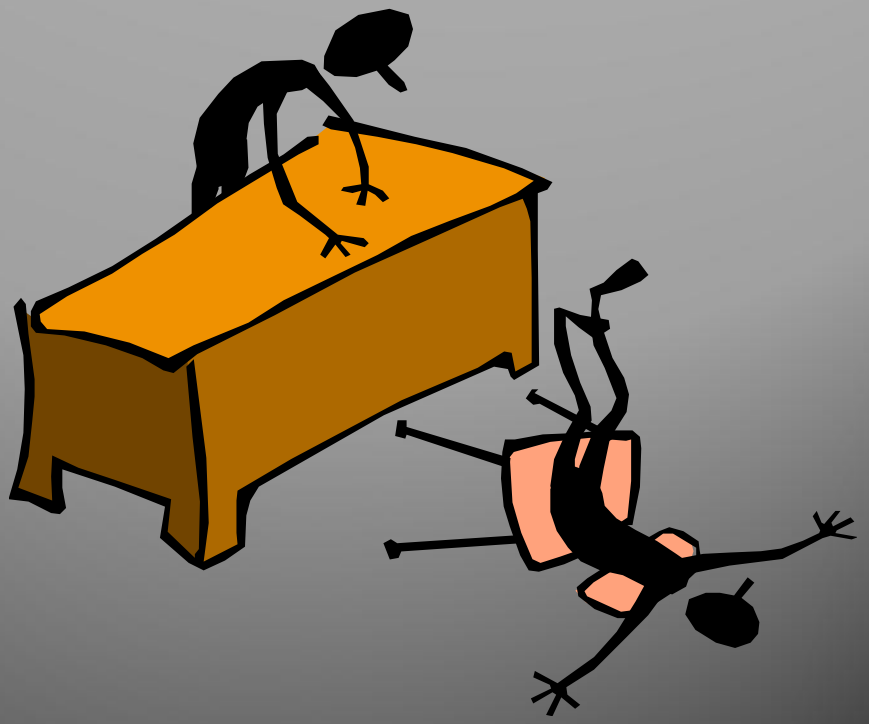
- Type 2 DM (may also need advanced CHO Counting)
- Type 1 DM (Will likely need advanced CHO counting as well)
- GDM
- PCOS

Before the Patient Visit:

- Refer patient for MNT (Nutrition Clinic: BALA)
- Initial Appointment time is 60 minutes (CHO counting can be taught in class setting). Follow-ups, 30 minutes.
- Instruct patient to keep a 3 day food log and bring this to the appointment.
- Bring SMBG log to appointment

DM Patients can be overwhelmed

- Try not to cram all teaching points into one session
- Adult learners have an attention span of about 20 minutes
- Utilize interactive activities for teaching
- Schedule follow-up



Assessing the Patient

- Varying levels of education/knowledge
- SMBG? How often?
- BG Goals?
- Typical meal schedule
- Family support
- Taking meds? (timing of meds)
- Supplement/herbal usage
- Issues with hypoglycemia (knowledge of tx)
- Exercise (how often, duration, when?)
- Cultural or religious food practices
- Readiness for change

Explain the Rationale for CHO Counting

- CHO converted to glucose
- Counting CHO's helps to maintain a consistent intake throughout the day
- Not a low CHO plan but a controlled CHO plan

- "What foods do you already know have CHO's?" (most patients know this, not all)

Tools for Teaching

- **Nutrition Facts panels from food labels** (have patients bring in labels from home to build your collection)
- **Measuring Equipment**
- **Calculator**
- **Food Models or pictures of food with CHO.**
- **Foods to measure (dry cereal, candy)**
- **Resources that list CHO counts of foods**
  - Exchange list booklet from ADA
  - Online Nutrition Info from restaurants

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Identify Food Groups that Contain CHO's

- Starches: breads, grains, cereals
- Starchy vegetables: corn, peas, beans, potatoes
- Milk, yogurt, ice cream
- Sugary foods
- Fat free foods
- Sugar free foods

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Identify Foods that do not Contain CHO's

- Meats, Seafood, Poultry
- Eggs
- Cheese
- Fats, margarines, butter, mayo
- Oils
- Nuts

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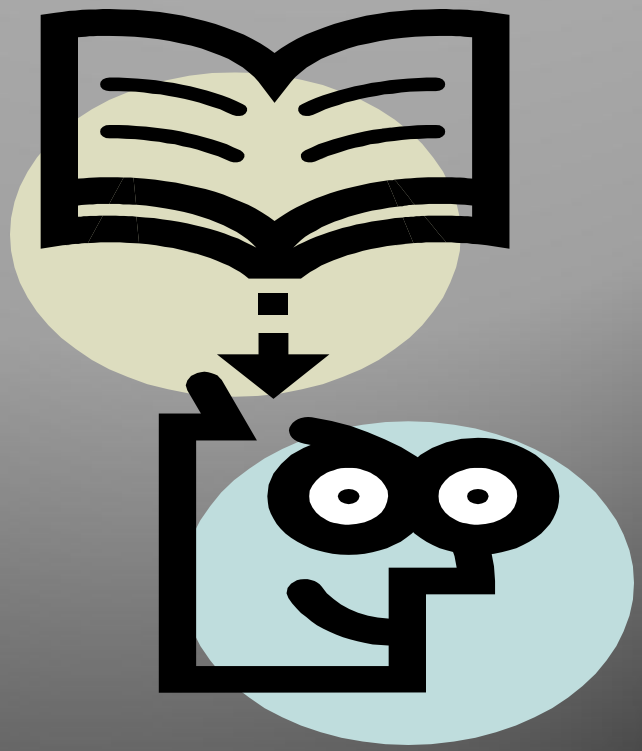
Dispel the Myth that CHO's are Bad

- Many CHO's are healthy food choices:
- Whole grains, fruits, vegetables
- Low-fat milk and yogurt



Benefits of CHO's

- Primary and preferred source of energy
- Provide essential vitamin, minerals
- Important source of dietary fiber

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Healthier and Less than Healthy CHO's

Healthier

Less than healthy

What's in a CHO serving?

Food Group	Serving	CHO (g)
bread	1 slice	15
Cereal (dry)	1 oz	15
pasta	1/3 cup	15
Starchy Veg	1/3 cup ½ cup	15
Fruit (fresh)	1 medium piece	15
Fruit juice	1/3 to ½ cup	15
Fruit canned no sugar	½ cup	15
Milk, plain yogurt	1 cup	12 (I say 15)
Vegetables	½ cup cooked, 1 cup raw	5

Daily CHO Needs

Physical Profile	Women (small stature and/or older) who desire weight loss, are small in stature and/or sedentary	Women (small stature , older, and/or sedentary) who desire weight maintenance or larger women who desire weight loss
Calorie Range	1200-1400	1400-1600
CHO (g)	160	180
CHO (servings/day, servings =15 g CHO)	10	11

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Daily CHO Needs

Physical Profile	Women (moderate to large stature) who are active and desire weight maintenance. Older men, and men (small to moderate stature) who desire weight loss	Children, teen girls, and active larger women, men (small to moderate statue) who desire weight maintenance. Men (large stature and active) who desire weight loss
Calorie Range	1600-1900	1900-2300
CHO (g)	210	260
CHO (servings/day, servings =15 g CHO)	13	16

Daily CHO Needs

Physical Profile	Teen boys, active teen girls, and active men (moderate to large stature) who desire weight maintenance	
Calorie Range	2300-2800	
CHO (g)	305	
CHO (servings/day, servings =15 g CHO)	19	

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What Does All This Mean?????

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Give Ranges per Meal

- Bfst: 30-75 g CHO
- Lunch: 45-75 g CHO
- Dinner: 45-75g CHO

- Snacks: 15-45 g CHO

- Lower ranges for first 2 categories, higher ranges for last 3 categories

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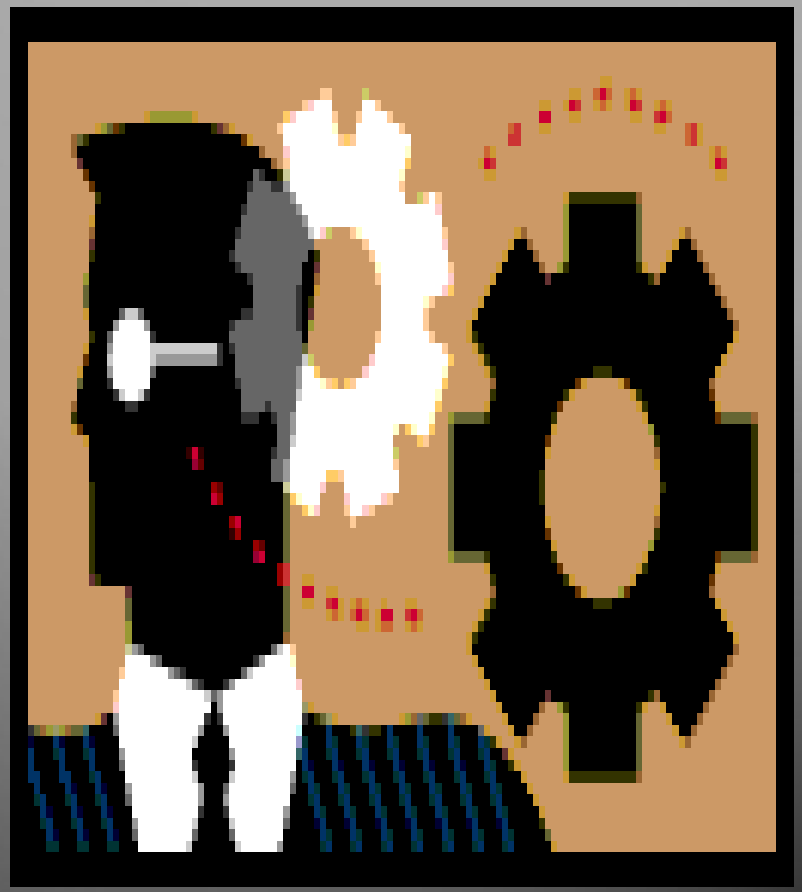
Use 3 day food log to Demonstrate CHO Counting

- Go over timing of meals
- CHO content of meals
- Problem solving
- Effects of exercise

Return Demonstration

- “Let’s say you are having lunch today. Show me a well balanced lunch with 45 g CHO.”
- Use food models, a menu, food log and count CHO’s to confirm 45 g CHO



Setting Goals:

- “Based on what we talked about, what do you think would be some good goals for you?”
- Measureable(3 meals per day, exercise 30 minutes 5x/wk)
- Realistic
- Incremental
- Perfection overrated

The Follow-up

- 2-3 weeks
- Bring food and SMBG logs (request 2 hr PP BG's)
- Decide detail of logs
- Review goals
- Provides opportunity to assess knowledge, answer questions, provide additional teaching
- More things to learn: advanced CHO counting, Sick Day Guidelines, Glycemic index

Janice: Types 2 DM, Glipizide 10 mg bid, Metformin 1000 mg bid, 1400 kcals

Time	Mon	Wed	Sat	Sun
Fasting	72 mg/dl	60 mg/dl	71 mg/dl	82 mg/dl
Bfst (45 g CHO)	2 eggs, 2 pieces toast w/ butter, ½ cup peaches	2 eggs, 2 pieces toast w/ butter, ½ cup peaches	2 pieces French Toast, 2 link sausage, 2 eggs, coffee, 1 cup 2% milk	1 cup oatmeal, splenda, ½ banana, splash milk, coffee
2 hr PP Bfst	138 mg/dl	210 mg/dl	240 mg/dl	197 mg/dl
What happened?				

Darryl: Types 2 DM, Metformin 1000 mg bid, 2200 kcals

Time	Mon	Wed	Sat	Sun
2 hr PP Lunch	188 mg/dl	155 mg/dl	145 mg/dl	195 mg/dl
Dinner (60 g CHO)	5 oz Grilled Chicken breast, 1 cup rice, 1cup broccoli	Cheese burger, small French fries diet coke	Grilled chicken Caesar salad, ice tea with splenda	BBQ chicken, mac and cheese, corn, biscuits, peach cobbler
2 hr PP Dinner	250 mg/dl	170 mg/dl	85 mg/dl	165 mg/dl
What happened?				

The Evidence of Things Not Seen

Look For:

- Possible tx for hypoglycemia
- Missed CHO sources
- Missed meds
- Meal timing issues
- Previous BG’s
- Timing of exercise/activity

Hand Outs

- Basic Carbohydrate Counting.
- Advanced Carbohydrate Counting
- Exchange Lists for Meal Planning

Available for purchase: American Diabetes Association or American Dietetic Association

Utilize DAT Toolbox for reproducible handouts

Websites

USDA Nutrient database

- http://www.ars.usda.gov/main/site_main.htm?modecode=12354500

Electronic food log

- www.mypyramidtracker.gov

DAT Toolbox

- http://www-nmcphc.med.navy.mil/prevmed/diabetes/

Questions?
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